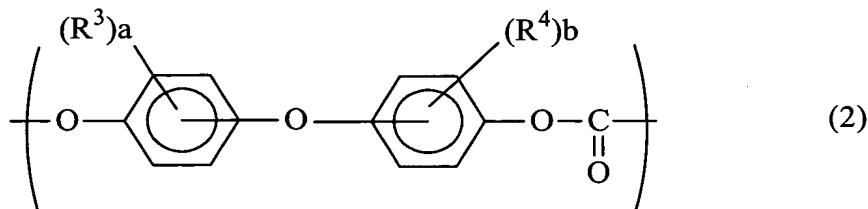


formula (2) and a structural unit with charge transporting properties, each of said structural units being contained in an amount of 5 wt.% or more of the total weight of said polycarbonate resin:



*A/  
Cont.*

wherein a and b are each independently an integer of 1 to 4; and R<sup>3</sup> and R<sup>4</sup> are each independently a halogen atom, an alkyl group having 1 to 6 carbon atoms, which may have a substituent, an alkoxy group having 1 to 6 carbon atoms, which may have a substituent, or an aryl group which may have a substituent, and R<sup>3</sup> and R<sup>4</sup> may each be the same or different when a and b are each an integer of 2, 3 or 4.

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#### SUPPORT FOR THE AMENDMENTS

The amendment to Claim 37 is supported at page 87, lines 4-18, and Figure 13. No new matter is believed to be added by entry of these amendments. Claims 1-42 are in the case, of which Claims 17-20, 22, 23, 31-33, 35, 37-39, and 41 are active.

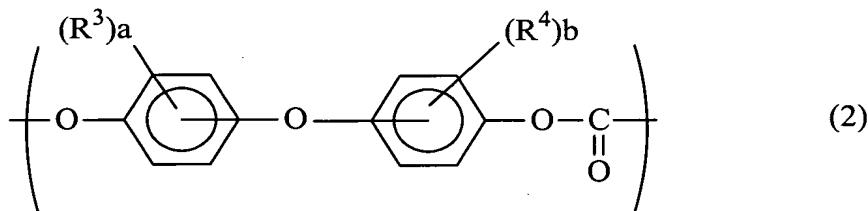
#### REMARKS

Applicants would like to thank RoDee for his courteous and helpful discussion with Applicants' representative on September 24, 2002. During the discussion, Applicants' representative pointed out that Ikuno, Tanaka, and Nagai all teach that unsubstituted diphenyl ether polycarbonates, or bisphenol A polycarbonates are suitable for electrophotographic

photoconductors. However, the disubstituted diphenyl ether polycarbonates of the present invention provide superior abrasion resistance in electrophotographic photoconductors.

The rejections of the claims under 35 U.S.C. § 103(a) over Ikuno and Tanaka, or Nagai are respectfully traversed. Ikuno and Tanaka, and Nagai all teach that unsubstituted diphenyl ether polycarbonates, or bisphenol A polycarbonates are suitable for electrophotographic photoconductors. However, the disubstituted diphenyl ether polycarbonates of formula 2 of the present invention provide superior abrasion properties.

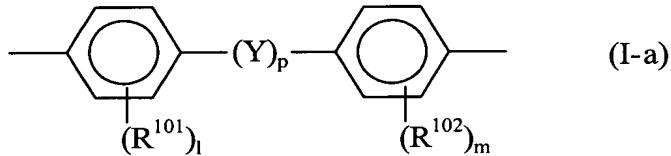
Copying machines and printers may have organic photoconductors having a layered structure, in which the charge transport layer comprises a binder resin comprising an aromatic polycarbonate resin and a low-molecular weight charge transport material. The low-molecular weight charge transport material decreases the mechanical strength of the aromatic polycarbonate binder resin, causing the charge transport layer of the organic photoconductor to have poor abrasion and scratch resistance. This reduces the durability of the photoconductor, and hence the reliability of the copying machine or printer (present specification at page 2, line 16 to page 3, line 11). The electrophotographic photoconductor of the present invention comprises an aromatic polycarbonate resin of formula (2), below.



The aromatic polycarbonate of formula (2) of the present invention is prepared from an aromatic diol component which is a diphenyl ether diol having at least one substituent on each aromatic ring (i.e.,  $R^3$  and  $R^4$ , in which "a" and "b" are independently 1-4). As shown in

Table 2 of page 105 of the present specification, electrophotographic photoconductors having a polycarbonate resin according to formula (2), have significantly improved abrasion properties compared to comparative electrophotographic photoconductors, in which the diol component of the polycarbonate is 2,2-bis(4-hydroxyphenyl)propane (i.e. bisphenol A; Comparative Example 2 at page 104 of the present specification) or an *unsubstituted* diphenyl ether diol (i.e., 4,4'-dihydroxy diphenyl ether, Comparative Example 1 at page 103 of the present specification).

As noted by the Examiner, Ikuno fails to describe an electrophotographic photoconductor having the particular polycarbonate resin of formula (2) of the present invention. Ikuno describes polycarbonates (structure (I), column 3, lines 25-35) having a repeating unit "X" represented by structure "I-a" (column 3, lines 40-55, and at column 6, lines 13-32), below.



The linking group "Y" of structure I-a may include alkylene groups or -O-, as well as a variety of other groups. Subscripts "l" and "m" may be "independently an integer of 0 to 4" (column 3, lines 51-52). Thus, structure I-a of Ikuno includes thousands of different groups, and need not be substituted on the phenyl rings. Applicants note that the single diphenyl ether group expressly described in Ikuno (i.e., 4,4'-dihydroxy diphenyl [ether]; column 6, line 14), has *unsubstituted* aromatic rings, like those of the aromatic polycarbonate resin of Comparative Example 1 at page 103 of the present specification. Thus, the polycarbonate of Comparative Example 1 of the present invention is a polycarbonate according to Ikuno. In addition, Ikuno also teaches that 2,2-bis(4-hydroxy phenyl)propane (i.e., bisphenol A; column 6, lines 16-17)

may be used to prepare suitable aromatic polycarbonates. Applicants note that the aromatic polycarbonate of Comparative Example 2 at page 104 of the present specification is prepared from bisphenol A. Thus, the polycarbonate of Comparative Example 2 is also a polycarbonate according to Ikuno. As discussed above, Table 2 at page 105 of the present specification compares the abrasion resistance of electrophotographic photoconductors having the aromatic polycarbonate resin binder of formula (2) of the present invention (prepared from aromatic diphenyl ether diols substituted on both aromatic rings), and electrophotographic photoconductors having an aromatic polycarbonate resin binder prepared either from an unsubstituted diphenyl ether diol (Comparative Example 1), or bisphenol A (Comparative Example 2). The electrophotographic photoconductors prepared using the aromatic polycarbonate of the Comparative Examples (i.e., polycarbonates according to Ikuno) have significantly poorer abrasion resistance compared to the electrophotographic photoconductors prepared from the aromatic polycarbonate resin binder of the present invention. Thus, Ikuno fails to recognize that the polycarbonates of the present invention provide improved properties.

Similarly, Tanaka describes polycarbonates prepared from a wide range of aromatic diols which may be substituted or unsubstituted on the aromatic rings (column 5, lines 1-40). Although the aromatic diols of Tanaka may include diphenyl ether diols, these diphenyl ether diols also need not be substituted on the aromatic rings, as are the aromatic polycarbonates of the present invention (i.e., the subscripts "a" and "b" of the substituents R<sup>3</sup> and R<sup>4</sup> of the structure at column 5, lines 15-20 may have a value of zero). Furthermore, Tanaka expressly teaches that suitable aromatic polycarbonates may be prepared from 4,4'-dihydroxy diphenyl ether, 4,4'-dihydroxy-3,3'-dimethyl diphenyl ether, or 2,2-bis(4-hydroxyphenyl)propane (i.e., bisphenol A) (column 116, lines 11, 44, and 45). Thus, Tanaka also teaches that aromatic

polycarbonates prepared from *unsubstituted* diphenyl ether diols, or bisphenol A are *equivalent* to aromatic polycarbonates prepared from substituted diphenyl ether diols. However, as discussed above, Table 2 of the present specification clearly shows that aromatic polycarbonates prepared from the substituted diphenyl ether diols of the present invention (i.e., polycarbonates of structure (2)), provide superior abrasion resistance compared to aromatic polycarbonate resins prepared from the 4,4'-dihydroxy diphenyl ether of Tanaka (i.e., Comparative Example 1) or from bisphenol A (i.e., Comparative Example 2). Thus, Tanaka also fails to recognize the superior abrasion resistance properties of the polycarbonate resins prepared from polycarbonates of structure (2) of the present invention.

Likewise, Nagai describes polycarbonates prepared from a wide range of aromatic diols which may be substituted or unsubstituted on the aromatic rings (column 2, lines 36-67). Although the aromatic diols of Nagai, like those of Tanaka, may include diphenyl ether diols, these diphenyl ether diols need not be substituted on the aromatic rings, as are the aromatic polycarbonates of the present invention (i.e., the subscripts "a" and "b" of the substituents  $R_2$  and  $R_3$  of the structure at column 2, lines 47-53 may have a value of 0). Furthermore, Nagai also expressly teaches that suitable aromatic polycarbonates may be prepared from 4,4'-dihydroxydiphenyl ether, 4,4'-dihydroxy-3,3'-dimethyldiphenyl ether, or 2,2-bis(4-hydroxyphenyl)propane (column 38, lines 13 and 40-41). As discussed above, Table 2 of the present specification clearly shows that aromatic polycarbonates prepared from the substituted diphenyl ether diols of the present invention (i.e., polycarbonates of structure (2)), provides superior abrasion resistance compared to aromatic polycarbonate resins prepared from the 4,4'-dihydroxydiphenyl ether or 2,2-bis(4-hydroxyphenyl)propane of Nagai (i.e., Comparative Examples 1 and 2 of the present specification). Thus, Nagai also fails to recognize the superior abrasion resistance properties of the polycarbonate resins prepared

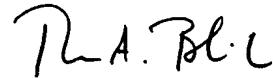
from the polycarbonates of structure (2) of the present invention.

As discussed above, Ikuno, Tanaka, and Nagai describe aromatic polycarbonates prepared from a wide variety of different aromatic diols. Ikuno, Tanaka, and Nagai teach that the aromatic diol component of suitable aromatic polycarbonate resins may be an *unsubstituted* diphenyl ether diol, or bisphenol A. Neither Ikuno, Tanaka, nor Nagai recognize that aromatic polycarbonates prepared from *substituted* diphenyl ether diols provide superior abrasion resistance in electrophotographic photoconductors, compared to polycarbonates prepared from unsubstituted diphenyl ether diols or bisphenol A, and therefore none of the applied references can reasonably suggest the electrophotographic process cartridge having a photoconductor with a photoconductive layer comprising the aromatic polycarbonate resin of the present invention. Accordingly, the combination of Ikuno and Tanaka, or Nagai fails to suggest the electrophotographic photoconductor of the present invention.

The rejection of the claims under 35 U.S.C. § 112, second paragraph, is obviated by appropriate amendment. Claim 37 has been amended to list structural elements of the process cartridge. Accordingly, Applicants respectfully request withdrawal of the rejection.

Accordingly, for the reasons stated above, Applicants respectfully request withdrawal of the rejections. Early notification thereof is respectfully requested.

Respectfully submitted,  
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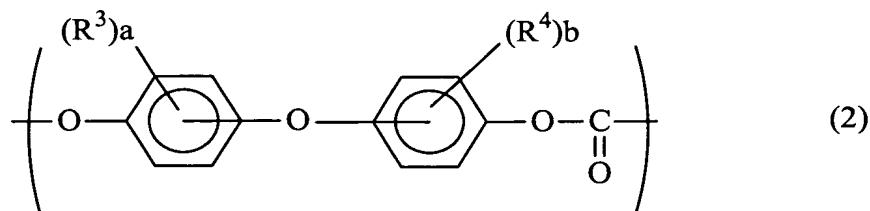
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Serial No: 10/051,230  
Amendment Filed on: HEREWITH

IN THE CLAIMS

37. (Amended) An electrophotographic process cartridge comprising an electrophotographic photoconductor capable of forming a latent electrostatic image thereon, and at least one of a charging unit, a light exposing unit, a development unit, an image transfer unit, a cleaning unit, or a quenching unit, wherein said photoconductor comprises an electroconductive support, and a photoconductive layer formed thereon comprising as an effective component an aromatic polycarbonate resin which comprises a structure unit of formula (2) and a structural unit with charge transporting properties, each of said structural units being contained in an amount of 5 wt.% or more of the total weight of said polycarbonate resin:



wherein a and b are each independently an integer of 1 to 4; and R<sup>3</sup> and R<sup>4</sup> are each independently a halogen atom, an alkyl group having 1 to 6 carbon atoms, which may have a substituent, an alkoxy group having 1 to 6 carbon atoms, which may have a substituent, or an aryl group which may have a substituent, and R<sup>3</sup> and R<sup>4</sup> may each be the same or different when a and b are each an integer of 2, 3 or 4.